



Commonwealth of Massachusetts  
Executive Office of Energy & Environmental Affairs

## Department of Environmental Protection

One Winter Street Boston, MA 02108 • 617-292-5500

DEVAL L. PATRICK  
Governor

RICHARD K. SULLIVAN JR.  
Secretary

KENNETH L. KIMMELL  
Commissioner

February 25, 2014

Robert Cianciarulo  
Massachusetts Superfund Section  
U.S. EPA, Region 1  
One Congress Street, Suite 1100  
Boston, MA 02114

Re: Groundwater Use and Value Determination  
Nyanza Chemical Waste Dump Superfund Site (RTN #3-0000216)

Dear Mr. Cianciarulo:

Enclosed please find the Groundwater Use and Value Determination prepared by the Massachusetts Department of Environmental Protection for the Nyanza Chemical Waste Dump Superfund Site in Ashland.

In determining the use and value of the groundwater in proximity to the Site, we referred to the groundwater classification system in the Massachusetts Contingency Plan (MCP). The classification in the MCP considers all the factors in the Use and Value Guidance. Enclosed with this Use and Value Determination are the GIS map used to determine the aquifer classification. The maps provide a variety of information, including the United States Geological Survey yield classification, the presence of public water supplies and zones of protection, surface water bodies, wetlands, protected open areas, and drainage basin boundaries.

If you have any questions regarding this letter, please do not hesitate to contact David Buckley at 617-556-1184.

Sincerely,

Jay Naparstek  
Deputy Division Director

File: Q:BWSC\BWSC\Superfund\_Documents\NPL\_Sites\Nyanza\07\_Remedial\_Action\01\_Correspondence

This information is available in alternate format. Call Michelle Waters-Ekanem, Diversity Director, at 617-292-5751. TDD# 1-866-539-7622 or 1-617-574-6868

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## GROUNDWATER USE AND VALUE DETERMINATION Nyanza Chemical Waste Dump Superfund Site Ashland, MA

February 2014

### INTRODUCTION

Consistent with the U.S. Environmental Protection Agency's (EPA) 1996 Final Ground Water Use and Value Determination Guidance, the Massachusetts Department of Environmental Protection (MassDEP) has developed a Use and Value Determination of the groundwater impacted by the Nyanza Chemical Waste Dump Superfund Site in Ashland (the Site). The purpose of the Use and Value Determination is to identify whether groundwater is of "High", "Medium", or "Low" use and value. In the development of this Use and Value Determination, MassDEP has applied the criteria for groundwater classification as promulgated in the Massachusetts Contingency Plan (MCP). The classification contained in the MCP considers criteria similar to those recommended in the Use and Value Determination Guidance agreed to in a Memorandum of Agreement (MOA) between EPA and MassDEP dated March 23, 1998.

The classification of groundwater is location specific within the review area and certain areas meet high, medium, or low use and value for the reasons detailed below. The determination should be reevaluated if the assumptions change. A brief background of the Site, an explanation for the final Use and Value Determinations, and a table listing the criteria that facilitated the decision making follow below.

### BACKGROUND INFORMATION

The Nyanza Chemical Waste Dump Superfund Site is located in the Sudbury River sub-watershed of the Charles River basin consisting of large tracks of wetlands, streams and rivers and impounded waterways. Land use north of the site is primarily industrial, and includes a commuter rail parking lot; to the east are wetlands and woodlands, and woodlands to the south and west. The landfill cap is approximately 14

acres in size, though the entire site including the groundwater plume extends approximately 3000 feet to the northeast.

Because of the large amount hydrogeologic data collected over the past thirty years, the review area was limited to the known groundwater plume. This information collected by EPA and MassDEP demonstrates that the plume extent both horizontally and vertically is stable. Figure 1 represents the review area.

Soils in the review area have been classified as silty fine sand to sandy silt (glaciolacustrine sediments) nearer the cap area and as gravel and cobbles nearer Pleasant Street (glaciofluvial sediment) with a thickness ranging from 3.5 feet to 11.5 feet in the northern parts of the review area. Bedrock surface is at an elevation of 350 feet msl at Megunko Hill and slopes downward toward the north to an elevation of 180 feet msl. There is a meandering bedrock trough near the railroad tracks and Pleasant Street. The direction of the trough is generally in a west to east direction and thought to be the pre-glacial river valley. Bedrock is generally competent greater than 15 feet in depth. The bedrock above 15 feet can be slight to highly fracture with the general direction of near vertical fractures N60E to N60W. Hydraulic conductivity ranges from  $5 \times 10^{-5}$  to  $1 \times 10^{-3}$  and does not vary significant at depth for soils and from no flow to  $2 \times 10^{-3}$  in bedrock depending on depth. <sup>i</sup>

Horizontal groundwater flow in both the unconsolidated and consolidated aquifer is generally from the south to the north and northeast, finally discharging into the Sudbury River. Vertical gradients trend downward overall with eventual discharge into the Sudbury River. Depth to groundwater is typically 20 to 30 feet from ground surface on Megunko Hill to near surface at the Sudbury River. Figure 1 presents the maximum extent of the groundwater plume exceeding MCP Groundwater 1 reportable concentrations. This determination is limited to the existing plume area, as it is well defined and stable.

Medium and high yield aquifers, as mapped by the United States Geological Survey, are defined as Potentially Productive Aquifers (PPAs) by MassDEP. All PPAs within the review area are located north and northeast of the landfill, primarily along the southern shore of the Sudbury River and the area of Tilton Avenue, Cherry Street and Pleasant Street. Figure 1 highlights the PPAs.

There were no public or private drinking water supply wells or surface water intakes identified within or near the review area. The nearest public wells are located 10,000 feet west of the review area at the Hopkinton Reservoir. Public water supply sources are identified on Figure 2, which in addition to the Hopkinton Reservoir wells, indicates public wells located 8,000 feet south of the site near the Ashland Reservoir (well I.D. 3014000-0AG). Communications with MassDEP Division of Water Supply indicated those wells do not exist, do not have any permits, nor are they under consideration as a water supply at this time (J. Persky, MassDEP/DWS, Personal Communications, 11/14/2013).

Information available through MassDEP's well driller's certification program indicated no private water supplies in the review area. The Ashland Board of Health also confirms that no private wells have been installed in or near the review area (M. Oram, Ashland BOH, Personal Communications, 10.24.2013). Previous investigations conducted in 2003 also indicated there are no private wells installed in the review area<sup>ii</sup>. Based on MassDEP records, the nearest private wells are located 2,000 feet northeast, 4,500 feet northwest, and 5,000 feet west of the site, outside the review area.

The review area contains significant wetland resource areas east, north, and west of the site landfill cap. These areas are groundwater discharge areas. The wetlands receive a significant component of flow from groundwater. Also nearby, the Sudbury River receives a component of flow from groundwater. Groundwater is a critical components to both the health and sustainability of the water resource areas. There are no known state endangered or species of special concern within the review area.

## DETERMINATION

A number of considerations are used to determine the use and value of the review area groundwater including the groundwater classification system in the Massachusetts Contingency Plan (310 CMR 40). Groundwater classified as GW-1 are those waters that are currently or have the potential to be used for water supplies. Groundwater is classified as GW-1 if it is located:

1. Within a current drinking water source area, which includes groundwater located;
  - a. Within a Zone II for a public water supply
  - b. Within an interim wellhead protection area for a public water supply
  - c. Within a Zone A of a Class A surface water body used as a public water supply, or
  - d. Within 500 feet of a private well
2. Within a potentially drinking water source area, which includes groundwater located:
  - a. 500 feet or more from a public water supply distribution pipeline,
  - b. Within an area designated by a municipality specifically for the protection of groundwater to ensure its availability as a source of potable water,
  - c. Within a potentially productive aquifer

There are no known current public or private drinking water supplies, mapped or interim Zone II wellhead protection areas, or Zone A protection areas within the review area. Therefore, the groundwater within the review area is not considered a current drinking water source area.

Regarding the potential for future water supply uses of groundwater, review of property maps available at the Ashland Assessors Office and the Southern Middlesex Registry of Deeds indicate that at least a portion of all property lots within the review area are within 500 feet of a public water distribution line. Figure 3 indicates parcels and existing public water lines.

The groundwater within the review area is not designated as a groundwater protection district or otherwise specifically protected by the Town of Ashland for the purposes of future potable water.

The United State Geological Survey designates portions of the aquifer within the study area as medium yield, thereby meeting the definition of a PPA. These areas are identified on Figure 1. Areas shaded in grey on Figure 1 are considered non-potential drinking water source areas (NPDWSAs). NPDWSAs are aquifers classified as medium or high yield, but due to current land use, are not considered suitable for potable water. Landuses considered inconsistent with the use of groundwater as potable water are industrial, commercial, or multi-family housing on dense lots, typically less than ¼ acre. Also designated urbanized areas or areas having a population density greater than 4,400 people per square mile based on the 1990 census block designation are considered NPDWSAs.

For the purposes of this discussion, the PPAs identified in the review area have been identified on Figure 1 as PPA1, PPA2, PPA3, and PPA4. PPA1 is generally within the Ashland town center and includes portions of Pleasant Street, Tilton Avenue, and Cherry Streets. Although not identified on Figure 1 as a NPDWSA, review of site conditions in PPA1 indicate that it includes multi-family housing on dense lots in a town center setting near railroad tracks and industrial buildings. PPA2 is located between Megunko Road and the railroad tracks. Abutting activities include industrial and commercial activities to the east and west of PPA2. PPA3 is also located in an area which include a number of industrial and commercial activities along with multi-family housing. PPA1, 2, and 3 are in areas unlikely to support potable water supplies due to existing site uses and are consistent with NPDWSAs. Therefore MassDEP considers these areas unlikely to support future potable water supply sources.

Potentially Productive Aquifer (PPA4) is located between Pleasant Street and the Sudbury River. The primary landuse is single and multi-family units on lots that average ½ acre in size. Though unlikely to provide a source of potable water due to the density of housing, with the proximity to the Sudbury River and slightly overall larger lots, this future use cannot be completely discounted and therefore PPA4 is considered a potential future water supply source area.

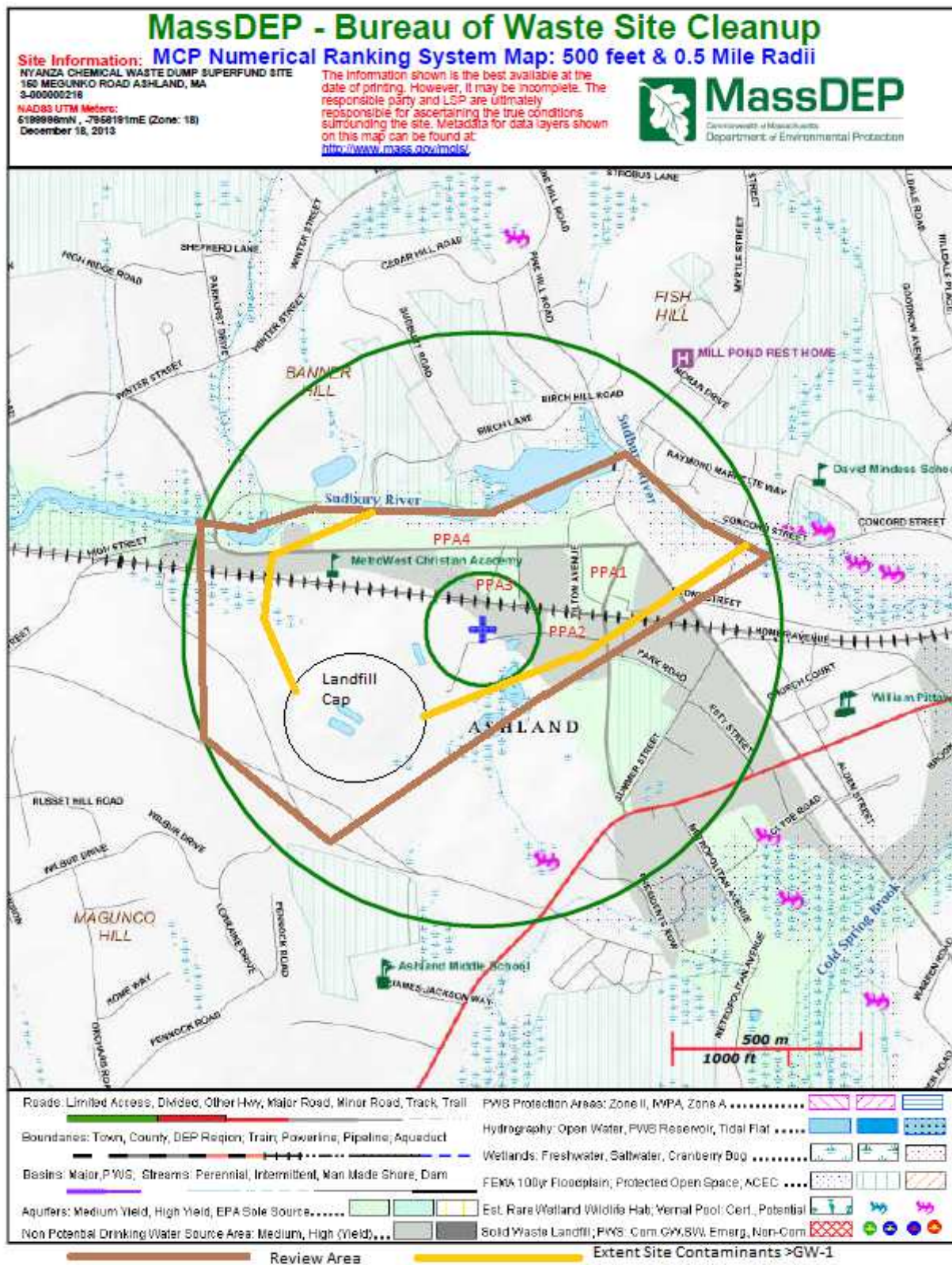
All groundwater in the Commonwealth is classified as GW-3, which considers the ecological and human health impacts and risks associated with the discharge of groundwater to surface water. Overall the aquifer has significant current ecological value for its contribution to adjacent wetlands and river systems.

Based on considerations discussed above, MassDEP assigns the groundwater in the study area as of medium use and value. The PPA4 area is considered a potential future water supply area and should be evaluated as such in any future evaluations of risk. Groundwater beneath the remainder of the site, while not considered as potential sources of water supply, is considered important for ecological purposes. Evaluations of risk in these areas should include ecological impacts. Evaluations of risk and cleanup decisions in all areas of the site should include other potential human health risks including indoor air and other incidental exposures. Table 1 provides the use and value for all the factors considered.

TABLE 1

Groundwater Use and Value Considerations				
Factors	High	Medium	Low	Comments
1. Quantity		X	X	Portion of the aquifer considered medium yield based on data from the U.S.G.S. Bedrock unlikely to provide suitable quantities for public use.
2. Quality		X		Data taken from historic water analysis indicate water is suitable for potable uses with treatment excluding Nyanza contaminants. Some high risk land uses within the review area and other sources of pollutants exist (21E Sites).
3. Current Public Water Supply Source			X	There are no known public or non-community water supply sources within review area.
4. Current Private Water Supply Source			X	There are no known private water supply sources in the review area.
5. Likelihood and I.D. of Future Drinking Water Source		X	X	Within PPA4 medium. Rest of review area low. Most of review area considered non-potential drinking water source area..
6. Other Current or Reasonable Expected Groundwater Use(s) in Review Area		X		Groundwater is or has the potential to be used for irrigation.
7. Ecological Value	X			Groundwater in the study area discharges to significant wetland resource areas.
8. Public Opinion			X	Public would not likely consider the groundwater in the aquifer to be a desirable potential future water supply.

FIGURE 1



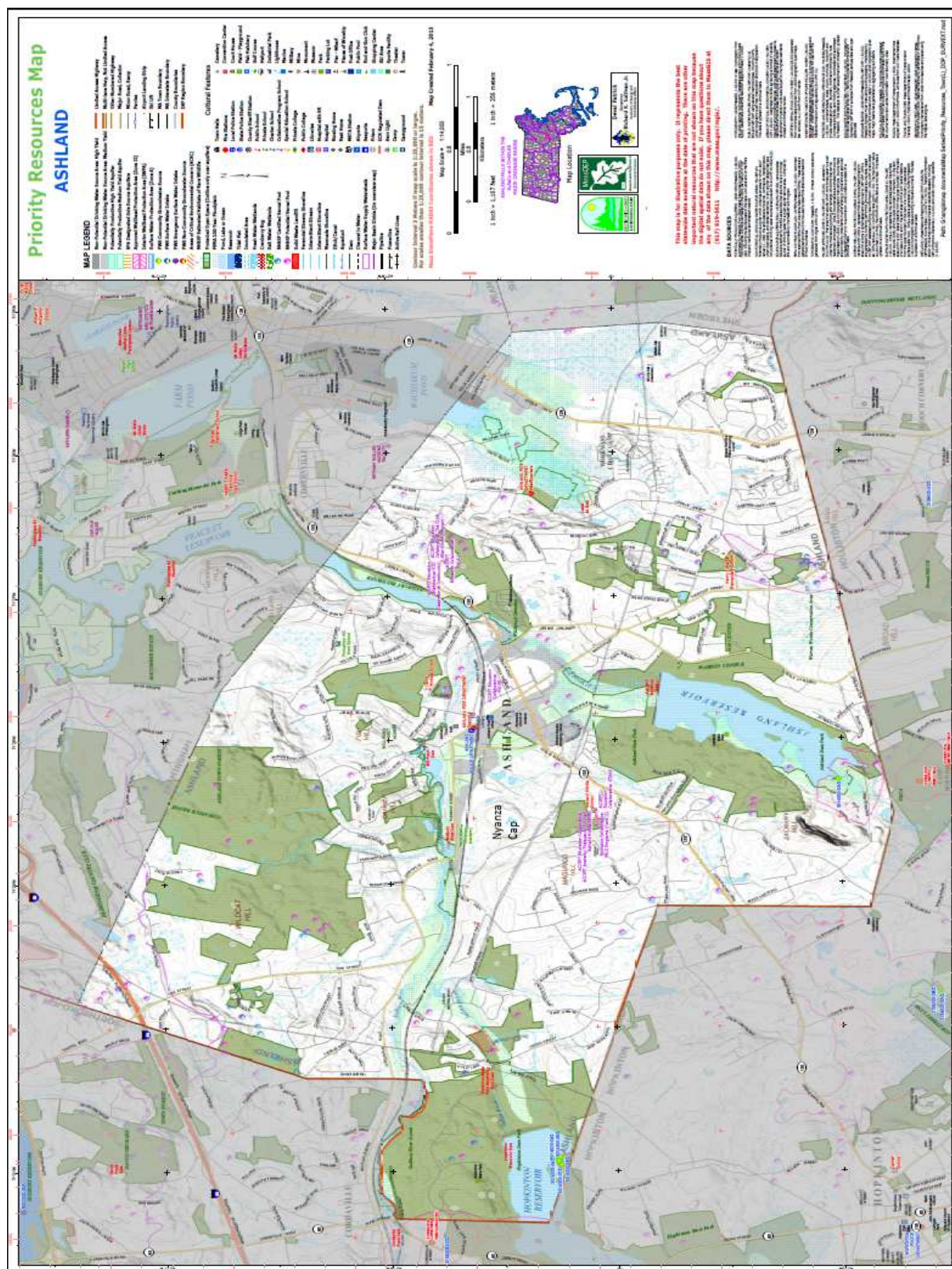
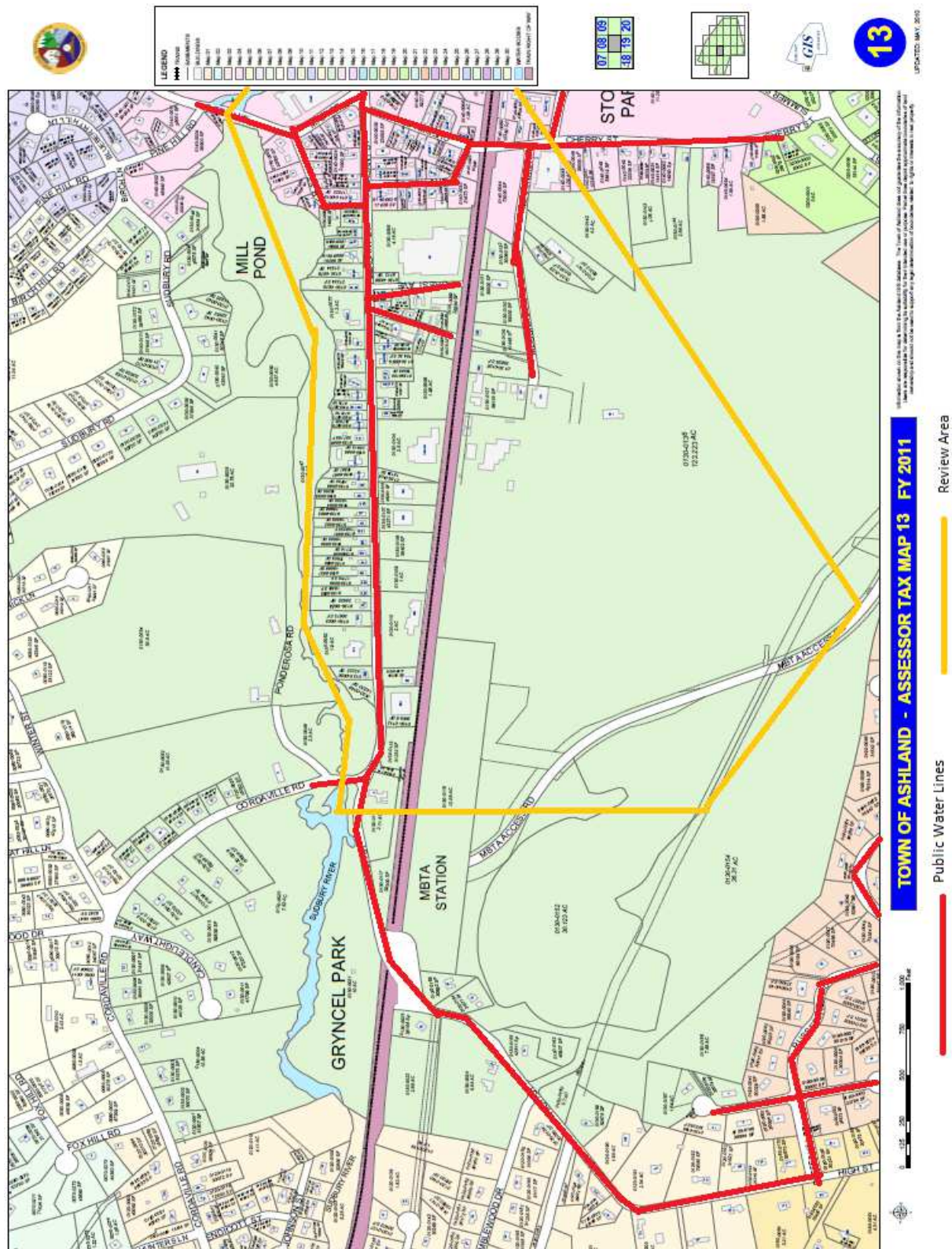


FIGURE 3



## REFERENCES

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- <sup>i</sup> ICF, International, 2006. *Conceptual Design for DNAPL Extraction System, Operable Unit II, Nyanza Chemical Waste Dump Superfund Site, Ashland, Massachusetts*. September 12, 2006.
- <sup>ii</sup> ICF Consulting, 2003. *Draft Memorandum, Nyanza OUII – Survey of Existing Residential Wells, Spring 2003*. October 20, 2003